⑲ 日本国特許庁 (JP)　　⑪ 特許出願公開

⑫ 公開特許公報 (A)　　昭56—59931

⑤1Int. Cl.³　識別記号　庁内整理番号
E 02 F 3/88　6634—2D

⑬公開 昭和56年(1981)5月23日

発明の数 1
審査請求 未請求

(全 3 頁)

⑤4水質汚濁防止循環混合気体水噴射ポンプ浚せつ工法

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㉑特 願 昭54—134749
㉒出 願 昭54(1979)10月20日

明 細 書

1. 発明の名称

水質汚濁防止循環混合気体水噴射ポンプ浚せつ工法

2. 特許請求の範囲

循環高圧泥水噴射ポンプ3. 毎分600~2,000ℓ吐出圧力20㎏~150㎏, 空気圧縮機4. 毎分1㎥-6㎥吐出圧力2㎏-25㎏を始動させ, 高圧ホース8. 9.を通して, 水面上の台船11にセットした。油圧昇降装置13により降下させた, 混合気体水噴射流送ポンプ1.水中気体導入装置2.が作動し, 水中下の土砂・砂ヘドロを最高水深200m, 常用3,0mの水深から毎分浚せつ量0.2㎥-1㎥, 最大水平流送距離120m, ただし120mを越えた場合は, 台船11内のゴミ取除機12でゴミを処理し, スラリーポンプ10により, 陸上の土砂

(1)

選別機7で, 土砂・砂・ヘドロを分離して, 泥水処理機6.処理能力毎時40㎥で, ヘドロ濁水を一次処理し, 一次処理水(濁水)を水タンク5.に送る。送りこまれた一次処理水(濁水)は, 再度, 循環高圧泥水噴射ポンプ3.により, 上記の作業を連続くりかえし, 水質を汚濁しないで浚せつをする。

本発明工法は, 上記の機械システムにより, 最大水深200mから, 水質を汚濁しないでかつ濁水・泥水を河川などに, たれ流さないで, 連続浚せつが施工出来るのが特徴である

3. 発明の詳細な説明

第1図 循環高圧泥水噴射ポンプ3. 空気圧縮機4. 水タンク5. 泥水処理機6. 土砂選別機7などと水面上の台船11 スラリーポンプ10 ゴミ取除機12 油圧昇降装置13 油圧旋回装置14 混合気体水噴射流送ポンプ1. 水中気体導入装置2.の機械システムの駆動に

(2)

より，水中下最大水深２００ｍ，常用３０ｍ～８０ｍの水深から，水質を汚濁しないで，しかも最低揚水量で効率よく，土砂・砂・ヘドロなど浚せつ出来る。また循環高圧泥水噴射ポンプ3.の使用により，一次処理水（濁水）を再度循環使用するので濁水の処置が簡単ですむのが特徴である。

第２図　混合気体水噴射流送ポンプ1.だけでは水中下の浚せつが不可能なので，従来の吸入管16に，水中気体導入装置2.を取り付け，水中下でも，混合気体流送を可能にしたため水深の深いダム・湖・河川・海などで，土砂・砂・ヘドロ，その他の固形物（吸入管の90φの大きさまで）の浚せつには最適である。

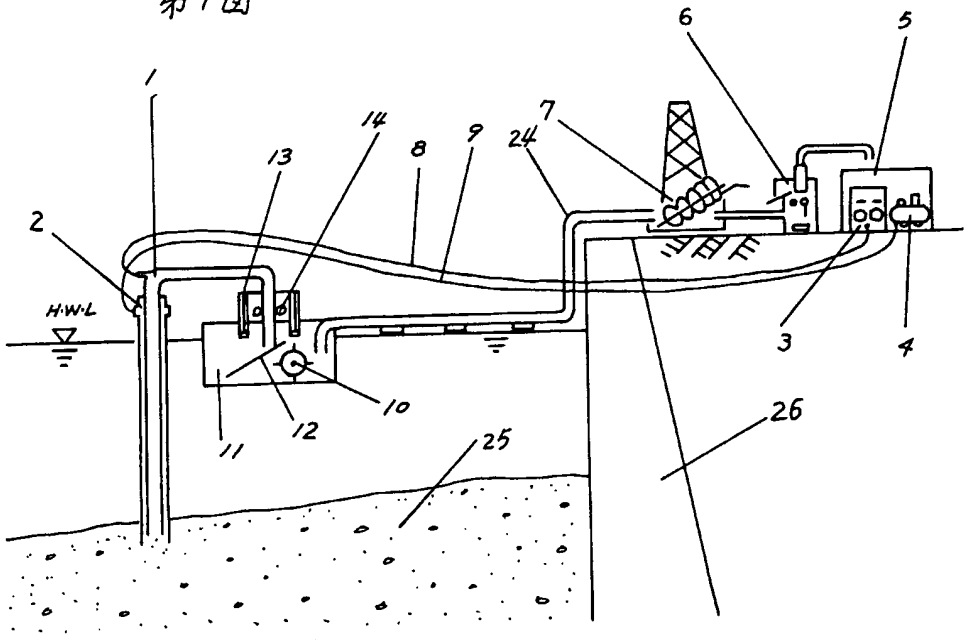
4. 図面の簡単な説明

第１図は本発明工法に係る水質汚濁防止循環混合気体水噴射ポンプ浚せつ工法の基本的構造を示す縦断平面図

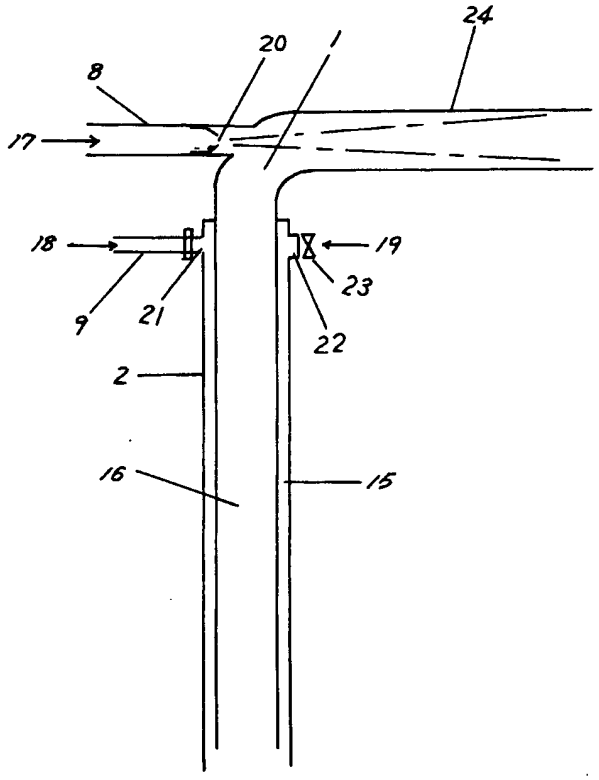
第２図は，混合気体水噴射流送ポンプと水中気体導入装置の構造断面図

1.混合気体水噴射流送ポンプ　2.水中気体導入装置　3.循環高圧泥水噴射ポンプ　4.空気圧縮機　5.水タンク　6.泥水処理機　7.土砂選別機　8.9.高圧ホース　10.スラリーポンプ　11.台船　12.ゴミ取除機　13.油圧昇降装置　14.油圧旋回装置　15.気体導入室　16.吸入口　17.高圧泥水　18.圧気　19.大気（空気）　20.泥水噴射口　21.圧気導入口　22.大気導入口　23.逆止弁　24.流送管　25.土砂・砂・ヘドロ　26.ダム堰壁（本体）

第１図



第2図



CLIPPEDIMAGE= JP356059931A

PAT-NO: JP356059931A

DOCUMENT-IDENTIFIER: JP 56059931 A

TITLE: DREDGING METHOD FOR PREVENTING WATER QUALITY FROM CONTAMINATION USING CIRCULATION HIGH-PRESSURE MIXTURE GAS, WATER INJECTION PUMP

PUBN-DATE: May 23, 1981

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APPL-NO: JP54134749

APPL-DATE: October 20, 1979

INT-CL (IPC): E02F003/88

US-CL-CURRENT: 37/322

ABSTRACT:

PURPOSE: To enable the re-circulation use of primary processed water and to simplify processing of muddy water by the use of a circulation high-pressure muddy water injection pump.

CONSTITUTION: With a circulation high-pressure muddy water injection pump 3 and an air compressor started, a mixture gas, water injection pump 1 and an underwater gas feeding device 2, which are lowered by a hydraulic lifting device 13, are actuated through high-pressure hoses 8 and 9, and

sediment, sand
sludge in water and at the bottom is processed in a dredging amount of 0.2m<SP>3</SP>∼1m<SP>3</SP> per minute, being pumped up from a maximum
depth of 200m, normally a depth of 30m. Dust in the sludge is processed by
means of a dust remover 12, and earth, sand, sludge are separated by a slurry
pump 10 and an earth and sand selector 7. Sludge muddy water is processed
primarily, and the operation is repeated again by means of a circulation high-pressure muddy water injection pump 3. This permits dredging of the sand
sludge without contaminating water quality.

PTO 02-5023

Japanese Kokai Patent Application
No. Sho 56[1981]-59931

DREDGING METHOD FOR PREVENTING WATER QUALITY FROM CONTAMINATION USING CIRCULATION HIGH-PRESSURE MIXTURE GAS/WATER INJECTION PUMP

Shigeo Takamura

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. OCTOBER 2002
TRANSLATED BY THE RALPH MCELROY TRANSLATION COMPANY

JAPANESE PATENT OFFICE
PATENT JOURNAL (A)
KOKAI PATENT APPLICATION NO. SHO 56[1981]-59931

Int. Cl.^{3}:	E 02 F 3/88
Sequence No. for Office Use:	6634-2D
Filing No.:	Sho 54[1979]-134749
Filing Date:	October 20, 1979
Publication Date:	May 23, 1981
No. of Inventions:	1 (Total of 3 pages)
Examination Request:	Not filed

DREDGING METHOD FOR PREVENTING WATER QUALITY FROM CONTAMINATION USING CIRCULATION HIGH-PRESSURE MIXTURE GAS/WATER INJECTION PUMP

[Suishitsu odaku boshi junkan kongo kitai suifunsha ponpu shunsetsu koho]

Inventor: Shigeo Takamura

Applicant: Shigeo Takamura

[There are no amendments to this patent.]

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Claim

Circulation high-pressure muddy water injection pump (3) and air compressor (4) are started at 600-2,000 L per minute at a discharge pressure of 20 kg/cm^2-150 kg/cm^{2*} and 1m^3 - 6 m^3 per minute at a discharge pressure of 2 kg/cm^2-25 kg/cm^2 respectively, mixture gas/water injection pump (1) and underwater gas feeding device (2) which are lowered by hydraulic lifting device (13) set on platform (11) are actuated through high pressure hoses (8) and (9), and earth, sand, and sludge in the water and at the bottom are dredged in a dredging amount of 0.2 m^3 - 1 m^3 per minute and at a maximum horizontal flow distance of 120 m from a maximum depth of 200 m, normally a depth of 30 m. However, if said distance exceeds 120 m, the refuse

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* [Due to the nature of the copy provided, units herein represent best guesses.]

in the sludge is processed with refuse remover (12) provided to platform (11), the earth, sand, and sludge are separated by on-land earth-sand selector (7) through slurry pump (10), the sludge muddy water is applied with primary processing in muddy water processor (6) at a processing performance of 40 m^3 per hour, and the primary processed water (muddy water) is fed to water tank (5). The fed primary processed water (muddy water) is repeatedly applied with the aforementioned operation continuously by circulation high-pressure muddy water injection pump (3) and dredging is performed without contaminating the water quality.

The method in the present invention is characterized by the fact that continuous dredging can be executed with the °caforementioned mechanical system from a maximum depth of 20-0 m without contaminating the water quality and without discharging the contaminated water and muddy water into a river, etc.

Detailed explanation of the invention

Referring to Figure 1, by driving a mechanical system comprised of circulation high-pressure muddy water injection pump (3), air compressor (4), water tank (5), muddy water processor (6), earth-sand selector (7), above water platform (11), slurry pump (10), refuse remover (12), hydraulic lifting device (13), hydraulic slewing gear (14), mixture gas/water injection pump (1), and underwater gas feeding device (2), earth, sand, and sludge can be dredged efficiently from a maximum underwater depth of 200 m, normally a depth of 30-80 m without contaminating the water quality and with a minimum rate of pump discharge. Also, by using circulation high-pressure muddy water injection pump (3), processing of muddy water is simplified since the primary processed water (muddy water) is circulated and reused.

Referring to Figure 2, dredging underwater is not possible with just mixture gas/water injection pump (1), hence underwater gas feeding device (2) was mounted to conventional suction pipe (16) and mixture gas flow was made possible even underwater, so it is optimal for dredging earth, sand, sludge, and other solids (size of up to 90% of the suction pipe) from deep dams, lakes, rivers, the ocean, etc.

Brief description of the figures

Figure 1 is a vertical cross section view showing the basic structure of the dredging method for preventing water quality contamination using a circulation high-pressure mixture gas water injection pump related to the method in the present invention.

Figure 2 is a cross-sectioned view for the structure of the mixture gas/water injection pump and underwater gas feeding device.

(1)...mixture gas/water injection pump, (2)...underwater gas feeding device, (3)...circulation high-pressure muddy water injection pump, (4)...air compressor, (5)...water

tank, (6)…muddy water processor, (7)…earth-sand selector, (8), (9)…high pressure hoses, (10)...slurry pump, (11)...platform, (12)…refuse remover, (13) hydraulic lifting device, (14)…hydraulic slewing gear, (15)…gas lead-in chamber, (16)…intake port, (17)…high pressure muddy water, (18)…pressurized air, (19)…the atmosphere (air), (20)...muddy water injection port, (21)…pressurized air lead-in port, (22)…air lead-in port, (23)…check valve, (24)…flow pipe, (25)…earth, sand, sludge, (26)…dam wall (main body).

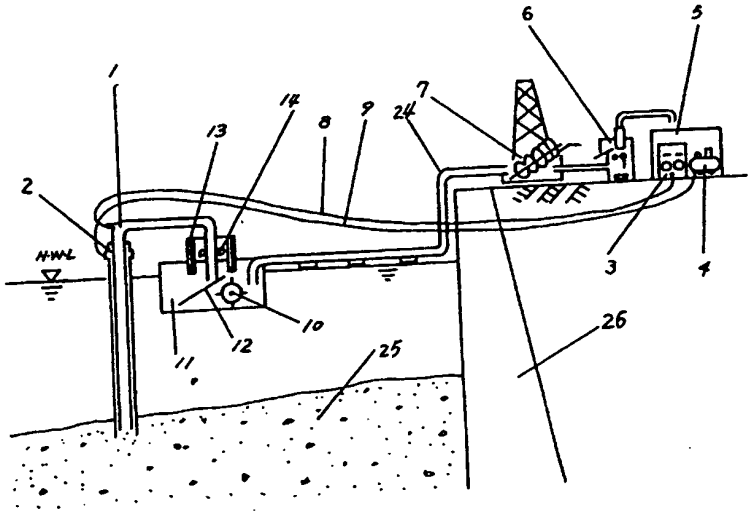

Figure 1

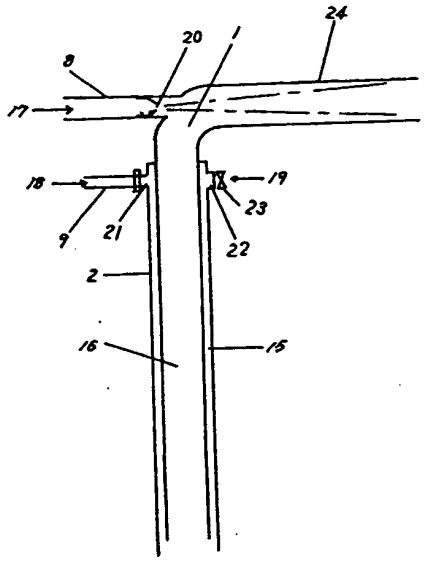

Figure 2